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ABSTRACT

The future of school-linked adolescent health centers cannot be determined without further evaluation. The recent development of school-linked health centers stems from concerns about the special health needs of adolescents. Currently there are 125 school-based and school-linked centers in operation. Characteristics include the following: (1) most are located in or near urban high schools with high concentrations of minority youth; (2) most provide primary health care, assessment and referral services, diagnosis and treatment of minor injuries, health education, and counseling; (3) almost half prescribe but do not dispense contraceptives, and about 21 percent dispense contraceptives; (4) most visits are for physical examinations, acute illnesses, and minor emergencies; and (5) reproductive health care accounts for less than 25 percent of the services provided. The centers are often held to standards that far exceed those for other forms of health care, because of the expectation that their link with schools would influence a broad range of social and behavioral outcomes. Evaluation results are preliminary, but findings indicate that parents support the centers and that adolescents utilize them. Major barriers to expansion include the following: (1) lack of stable funding; (2) limited number of well-designed evaluation studies; and (3) opposition on religious or philosophical grounds to the provision of reproductive services. Issues for future evaluation studies and policy considerations are included. A 65-item list of references is included. (FMW)

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THE POTENTIAL OF SCHOOL-LINKED
CENTERS TO PROMOTE ADOLESCENT
HEALTH AND DEVELOPMENT

Susan G. Millstein

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Susan G. Millstein

August 1988

This working paper was prepared for the February 1988 meeting of the Carnegie Council on Adolescent Development as part of its ongoing discussions about adolescent health as a component of comprehensive services for youth. The aim of the Working Paper series is to communicate to interested persons about the ongoing activities of the Council. The papers do not necessarily reflect the views of the Council or Carnegie Corporation.

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EXECUTIVE SUMMARY

BACKGROUND

Currently there are 125 school-based and school-linked¹ adolescent health centers in operation, with many more in the planning stages. The recent development of school-linked health centers stems from four major concerns about adolescents'² health and their often unmet needs for health care, disease prevention, and health promotion.

- Adolescents were the only age group to experience rising mortality rates over the years 1960 through 1981. Although the most recent data show a decrease or leveling off of mortality rates, the trends do not apply to all subsets of adolescents.
- The main causes of morbidity and mortality in adolescents are potentially preventable. These include accidents, homicide and suicide, substance use, and consequences of sexual activity.
- Adolescents underutilize health services in relation to their health needs. In this sense, the current health care system has not been effective in serving the adolescent age group.
- Adolescents have special needs as a function of their developmental status, including strong assurances of confidentiality, assistance in overcoming financial barriers to services, and guidance in negotiating the health care system.

¹ As used in this report, the term school-based refers to health programs that are physically located on school property. School-linked is a broader term which includes programs located adjacent to a school, as well as those on school grounds.

² The age range defining adolescence varies slightly as a function of the data source. Readers should refer to the original sources for definitions.

Most school-linked health centers are located in urban areas with high concentrations of poor, medically underserved adolescents who are members of racial or ethnic minority groups. However, examination of unmet needs in suburban youth suggest that school-linked centers could be useful in more affluent communities as well. The majority of centers serve high school populations, although 15 serve young adolescents in middle and junior high schools.

Most centers provide primary health care including physical examinations and laboratory tests, assessment and referral services to community health agencies, diagnosis and treatment of minor injuries, health education, and counseling related to substance use, sexuality, pregnancy and mental health. Almost half of all centers prescribe but do not distribute contraceptives; about 21% dispense contraceptives. Most visits to the centers are for physical examinations, acute illnesses and minor emergencies. Reproductive health care accounts for less than 25% of the services provided by these centers.

EVALUATION OF SCHOOL-LINKED HEALTH CENTERS

Controversy surrounding school-linked health centers has led to close scrutiny of their effects. In many respects, the centers are being held to standards that far exceed what is expected from other forms of health care delivery. In part this stems from the expectation that school-linked adolescent health centers would influence a broad range of social and behavioral

outcomes, as well as general health status. It may be unrealistic to expect the school centers to have a major impact on these complex behaviors, when other intervention programs have had limited success in altering similar behaviors. This is a crucial issue to resolve, since failure to achieve these ambitious goals may overshadow some of the real benefits that the centers can offer.

Most school-linked health centers have only been in existence two or three years so evaluation results are preliminary. Findings from evaluations indicate that parents are supportive of centers, and adolescents show good utilization of the health centers. Many adolescents who are seen in the health centers are self-referred, and would not receive health care if the centers did not exist. Centers are often successful in detecting serious health problems that might not otherwise be diagnosed or treated, since many students who use the centers have no other regular source of health care. Outcomes relating to pregnancy, substance use, and mental health status have been inconsistently affected. Evidence has not supported the contention that the availability of school-linked health centers increases rates of sexual activity among those adolescents who use the centers.

Future evaluation efforts should include the following:

- Identification of factors associated with successful implementation of centers in different communities.

- Assessment of the quality of care provided by centers.
- Assessment of factors associated with different patterns of utilization of centers by adolescents.
- Comparative studies of the benefits, limitations and cost-effectiveness of school-linked health centers with other health delivery systems for adolescents such as hospital-based adolescent clinics, office-based services, HMO's, and community-based health services.
- Longitudinal studies including control or comparison schools and matched subjects, evaluating a range of program outcomes including utilization, health status, psychosocial functioning, school attendance and performance, and cost of health services. These studies should follow cohorts at least into the early adult years.

THE POTENTIAL OF SCHOOL-LINKED HEALTH CENTERS TO SERVE ADOLESCENTS

Whether school-linked adolescent health centers will be an important component of the health care delivery system for adolescents cannot yet be answered. There is much to be learned about the effectiveness of school-linked adolescent health centers. However, they clearly are meeting some of the health care needs of adolescents at a relatively low cost.

School-linked adolescent health centers appear to fulfill many of the criteria considered important in adolescent health care such as confidentiality, reduction of financial barriers, and accessibility. However, these qualities may also characterize other approaches to health care delivery such as hospital-based adolescent clinics. Since no comparative studies

have been conducted under different conditions and for different subsets of the adolescent population, the question can not yet be answered as to which of the existing approaches - or others yet to be developed - provides the most effective delivery of health care to which groups of adolescents.

Three major barriers to the expansion of school-linked health centers exist. These include the lack of stable funding, the limited number of well-designed studies to support their effectiveness, and opposition on religious and philosophical grounds to the provision of reproductive services. However, school-linked health centers have received a great deal of support in recent years. Task force recommendations are usually supportive. Legislation has, and continues to be introduced in their favor. Organizations have been developed to assist centers in their implementation and continuation. Many health care organizations support their development. Given their potential and the urgent health needs of many adolescents, the informed expansion of the school-linked model with systematic monitoring and modifications based on research and experience is appropriate.

POLICY CONSIDERATIONS

Policy considerations emerge in four primary areas: policy and program development, the education of adolescent health professionals, the evaluation of adolescent health care systems, and public education efforts.

While there remain many unanswered questions regarding appropriate approaches to serve adolescents, the extent of their unmet health needs requires that policy and program development proceed based on the best available knowledge, professional judgment, and practice. A careful assessment of what we currently know about effective and promising approaches to providing health care services to adolescents could pave the way. Based on this assessment, the development of innovative approaches and models could evolve. Modifications that enhance current approaches in terms of accessibility and effectiveness should also be addressed.

Competent professionals who are sensitive to and care about adolescents are essential to their health care. There is a critical shortage of appropriately prepared professionals to work with adolescents in health care systems. Programs that educate health professionals for the adolescent population exist, but they do not appear to be adequate to serve the size of the population in need of services, and the nature of those populations. As a foundation for educating health care providers about adolescents, information about how different professional disciplines prepare providers for working with adolescents is needed. An effort should be made to support the dissemination and adoption of exemplary educational programs that currently produce health professionals to serve the adolescent population. Shortages of health professionals who come from minority backgrounds are especially evident, and will become more serious

as the proportion of minority adolescents increases over the next decade.

There remains an urgent need for careful evaluation of the effectiveness, quality of services, and costs of school-linked adolescent health centers. Studies that compare school-linked centers to other methods of delivering health care to adolescents are especially important. Such studies should attend to patterns of utilization, organization of services, financing, and quality of care issues, as well as adolescent health status and outcomes. To the extent that longer term outcomes are important, the prospect of longitudinal investigations should be considered. Careful evaluation is desirable, before the school-linked approach becomes firmly established as an acceptable health care delivery system. Practical problems in conducting such evaluations will require creative solutions.

Although there is growing awareness of the need to attend to the health care needs of adolescents, the level of public information on this subject remains less than optimal. Since public interest and support are essential for the creation of new initiatives that will increase health services for adolescents, more attention should be focused on efforts to inform parents, the American public, and key policy makers about the nature of adolescent development, particularly in relation to their health status and needs for appropriate services. The news and entertainment media could play an important part in providing this education.

THE POTENTIAL OF SCHOOL-LINKED³ CENTERS
TO PROMOTE ADOLESCENT HEALTH AND DEVELOPMENT

I. INTRODUCTION

A. Brief History of School-Linked Health Centers

The idea of offering health services within a school setting is not new. As early as 1890, the first school-based health care system emerged to deal with the large numbers of immigrant children who carried infectious diseases. Early efforts to control infection in the schools involved the use of visiting physicians, who focused on hygiene and other preventive efforts. Eventually, physicians were replaced by school nurses, due in part to funding limitations, lack of national policies for child health, opposition from the medical establishment, the availability of collaborative arrangements with private providers outside of the school system, and better training of the school nurse [1]. Some nurses were record-keepers, while others dispensed first-aid and conducted limited health assessments. Treatment remained in the realm of the private physician.

During the 1960's, there was an increased national commitment to human services, including health care for economically disadvantaged populations. A number of innovative programs were developed, including health care services designed to serve the many homeless and alienated youth of the

³ The term school-linked, as used in this report, refers to health centers located on school property, as well as health centers adjacent to schools.

sixties. Community-based comprehensive health service models such as the Haight-Ashbury Free Clinic, the Los Angeles Free Clinic, and The Door were developed to offer one-stop, free and confidential health services [1,2].

The school-linked health center represents a combination of these two approaches. Like programs in the early part of the twentieth century, it delivers health care within, or in close proximity to a school system. It also aims for the comprehensive health care approach common to alternative programs of the sixties.

School-linked health centers were developed, in part, because of the recognition that the health care needs of adolescents differ significantly from the needs of children or adults. The pattern and prevalence of behaviorally-related problems of youth are in sharp contrast to the infectious diseases common in childhood and the chronic illnesses of adults such as cardiovascular diseases and cancer. Accidents, homicide, suicide, substance use and consequences of sexual activity represent the major sources of morbidity and mortality during adolescence. The behaviors associated with these outcomes are complex, interrelated, and thus far, have been unresponsive to simple interventions. Adolescents, therefore, present an unusual pattern of problems to a categorically-based health care system.

Early developers of school-linked centers also hoped to bring health services to underserved adolescents. In 1981, the

Select Panel for the Promotion of Child Health [3] reported that adolescents were an underserved group with limited access to health care, particularly in services such as family planning, substance use prevention and mental health. School-linked health centers were viewed as an approach that would fill the large gap in service provision that the traditional medical settings had failed to address. By placing centers within the school setting or in close proximity, problems of access would be greatly reduced, thus increasing utilization among those in need of health services. In addition to providing more comprehensive and less categorically-based health care, centers also hoped to be more successful in influencing adolescents' health-related behaviors by integrating health education activities within both the school and the health center.

The first school-linked clinic was established in 1970, in West Dallas, Texas. The center developed as part of a Children and Youth project operated by the Department of Pediatrics at the University of Texas Health Sciences Center. It offered students a variety of services previously unavailable in a school setting, but did not offer reproductive health services at that time.

The first school-linked center to offer comprehensive services which included family planning was established in St. Paul, Minnesota, in 1973. The St. Paul clinic prompted serious consideration of the school-linked model for delivering

adolescent health care, primarily because of the attention it received when a reduction in students' pregnancy rates was reported in 1980 [4]. Between 1970 and 1983, school-linked adolescent health centers were initiated independently in about a dozen communities by health activists, who shared a concern for the problems of high risk youth. These early efforts were primarily organized in an attempt to decrease adolescent pregnancy rates, giving the movement a distinct family planning orientation. By 1984, many communities throughout the country began initiating plans for school-linked adolescent health centers, which gave the movement a grassroots quality. As of March, 1988, there were 125 school-linked health centers throughout the United States, with more than 100 planned for the future.

B. Health Care Needs of Adolescents

Compared to other age groups, adolescents appear fairly healthy. The only age group that shows lower mortality rates than adolescents are children from 5 to 12 years of age. Adolescents are infrequently hospitalized and have relatively low rates of disability and chronic disease. Why then, are so many people concerned about the health care of adolescents? There are a number of reasons for rising concern.

1. Mortality in Adolescents

Adolescents represent the only age group in the United States for whom mortality rates increased during the years 1960 through 1981 [5-7]. For all other age groups, mortality rates

dropped during the same time period. More recent data show a leveling off or decline in these rates, but not in all adolescent subsets [8].

Increases in adolescent mortality rates have been accompanied by a shift in the causes of mortality from those due to diseases to those related to social, environmental and behavioral factors. The three primary causes of mortality during adolescence are accidents, homicide and suicide [3,5,7,9,10]. More than 55% of the deaths in this age group are due to accidents [11], and motor vehicle accidents alone account for 37% of adolescent deaths [7]. Homicide is the second greatest cause of death among adolescents, and the first ranked cause for black males. Suicide accounted for nearly 10% of mortality between 1981 and 1984 [12]. Increases in rates of suicide have been confined to males, with females showing no increases or slight decreases.

2. New Morbidities of Adolescents

Shifts in the causes of mortality in youth have been accompanied by changes in the causes of morbidity as well. The new morbidities of adolescents include injury associated with the use of motor and recreational vehicles [13-15], substance use [16], and consequences of sexual activity such as pregnancy and sexually transmitted diseases [17,18].

Nonfatal injuries resulting from accidents account for the largest number of hospital days among young males and females, even when one includes pregnancy-related hospitalizations [5,

7]. Substance use, which is also associated with accidents, is extremely common among adolescents. In 1987, 92% of high school seniors had used alcohol. The use of illicit drugs also remains high; 50.2% of youth had used marijuana and 15.2% had used cocaine [19]. Sexually transmitted disease rates are higher among adolescents than any other age group; one-fourth of adolescents are infected with a sexually transmitted disease before graduating from high school [21,22]. In 1984, one-million teenagers became pregnant and 480,000 gave birth [22]. Almost 10,000 of the pregnancies occur in adolescents under the age of 15, a group which experiences maternal mortality rates 2.5 times higher than women in their twenties. Additional problems with a relatively high prevalence during adolescence include depression, eating disorders, and chronic handicapping conditions [23].

3. Adolescents' Perceptions of Their Health Needs

Adolescents' health concerns include both common medical concerns, as well as psychosocial issues. Common concerns that emerged in a socioeconomically mixed sample of 1400 adolescents included acne, obesity, menstruation, headaches, sexuality, sexually transmitted disease, substance use, "nervousness", dental problems, school problems and family issues [24]. Similar results have been reported for suburban, middle class youth [25]. For young people, health represents more than just the absence of illness. It reflects a wide spectrum of physical and emotional functioning that goes beyond physical

symptomatology [26].

4. Long-term Impact of Adolescent Behavior on Health

In addition to contributing to morbidity and mortality during adolescence, behaviors such as diet, smoking and substance use have long-term health effects. Many of the chronic diseases in adults such as cardiovascular disease and cancer are caused, in whole or part, by behaviors that have their onset during adolescence.

5. Adolescents: An Underserved Group

In 1981, the Select Panel for the Promotion of Child Health reported that adolescents were an underserved group with limited access to health care [3]. Although our knowledge of utilization patterns is limited by the types of national data that are collected [27], there are several indicators to suggest that adolescents are underserved.

Adolescents constitute 17% of the United States population but only 11% of the visits to private physicians, despite the fact that they experience a greater incidence of acute conditions than do adults [28]. In fact, adolescents visit private physicians at a lower rate than any other age group [29]. This is not because large numbers of adolescents are receiving care elsewhere; it is estimated that more than 70% of the health care visits made by patients under the age of 19 years are to private physicians [30]. Approximately 12% of adolescents have no regular source of medical care [3].

Using guidelines for examination schedules developed by the American Academy of Pediatrics (AAP) and the Early and Periodic Screening, Diagnosis and Treatment (EPSDT) program, the Select Panel on Child Health [3] reported that approximately 14% of children and adolescents under the age of 18 years do not receive the medical care they need. Recent data from California show that the percentage of adolescents attending school-linked health clinics who reported no contact with the medical system for the prior 2-3 years ranged from 11% to 44% [31]. Using the criteria established by the AAP and EPSDT program these adolescents are medically underserved. Among these adolescents, between 25% and 30% said they did not get medical care the last time they needed it. In New York, it has been estimated that 42% of the state's children, many of whom are adolescents, are medically indigent, receiving no health care or inadequate care [32]. Differences in utilization patterns as a function of sociodemographic factors further point to pockets of underserved adolescents, with more unmet needs among younger adolescents, minority group members, and those living in poverty [33].

When adolescents are seen by physicians, it is most frequently from general and family practitioners, internists, pediatricians, obstetrician/gynecologists and psychiatrists. The greatest number of office visits are for normal pregnancy, (overrepresented because it necessitates multiple visits), general medical examinations, acne, joint sprains, allergic

rhinitis, acute upper respiratory infections, acute inflammatory pelvic disease, neurotic and personality disorders, acute pharyngitis, and disorders of refraction and accommodation. With the exception of pregnancy-related visits and pelvic disease, most of the causes of adolescent morbidity and mortality are notably absent from this list. It is also of interest that short visits lasting less than 11 minutes are more common among adolescents than any other age group [33].

Mental health services are highly underutilized in relation to the need for the services. The 1978 President's Commission on Mental Health Task Force on Infants, Children and Adolescents viewed adolescents as one of the most underserved groups in the United States [34]. In 1986, the Office of Technology Assessment estimated that at least 12% of the nation's children were in need of some type of mental health treatment, but that fewer than one-third of those who needed it received any treatment [35]. Mental health services for adolescents often have long waiting lists.

It has been estimated that at any given time, more than 35% of the adolescent population requires dental treatment [36]. Many of these young people do receive care, although those from lower income families are severely underserved. Recommendations from the Canadian Task Force on the Periodic Health Examination [37] call for annual dental examinations for adolescents. Yet almost 10% of low-income youth in the United States have never seen a dentist, and nearly half do not see a

dentist annually [33].

Utilization of reproductive health care services shows significant underutilization. In 1981, only 57% of the estimated 5 million sexually active adolescent females received any family planning services. Almost 10% of pregnant adolescents receive either no prenatal care, or no care until the third trimester [38].

In addition to private practitioners and short-term hospitalization, adolescents receive care from a variety of other sources including emergency rooms, hospital-based ambulatory care, city and county agency clinics, community health centers, specialized categorical programs (i.e., family planning clinics), youth detention centers, and a variety of alternative health centers. Data on utilization from these types of settings are less available than that from settings such as hospitals, although they also suggest a pattern of underutilization.

6. Barriers to Health Care for Adolescents

Adolescents' underutilization of health services partially reflects barriers that they face as a function of their developmental status. One such barrier is cost. One in five adolescents does not have full year coverage of health insurance; over 7% have no coverage whatsoever [39]. Among ethnic minorities and those living in poverty, the situation is worse. Even low-cost clinics may be beyond the reach of many adolescents living in poverty.

A second barrier is confidentiality. Insurance coverage itself does not guarantee access; adolescents who are covered by parental health insurance may be reluctant to use it if they are concerned about parents' knowledge of their health care visit. Adolescents may not realize that, depending on law and local practices, they can receive confidential care from health providers. However, even when the law allows adolescents to consent for their own care and guarantees confidentiality, access is dependent on a source of payment [40].

A third set of barriers for adolescents are accessibility and availability of health services. Young people left to negotiate the health system on their own are often unsuccessful in doing so [41]. Many services are offered when adolescents are in school. Legal consent issues may affect accessibility as well. Many states will allow adolescents to consent for treatment in cases of emergency or "sensitive services" such as pregnancy, sexually transmitted disease and substance use. However, not all of adolescents' health needs fall into these categories. Some health services are inaccessible by virtue of the stigma attached to them. Adolescents may be reluctant to use mental health services if they are identified as such. Even when not so identified, adolescents may find it difficult to raise these issues; in a suburban sample of 649 adolescents, almost 10% acknowledged having concerns about emotional upsets and depression, but did not discuss these issues with their physician [25]. Adolescents may also have difficulty

acknowledging their sexuality, and underutilize family planning services that are not embedded within the context of more general health care.

Finally, adolescents' utilization may reflect the nature of the care they receive. Few providers have received specialty training preparing them to serve adolescents. Many health care providers report feeling unprepared to provide services such as contraceptive counseling, evaluation of psychopathology, general counseling and treatment of dysmenorrhea [42,43]. Providers may convey to adolescents their discomfort in discussing certain topics such as sexuality, which may result in adolescents' unwillingness to raise sensitive issues that concern them. Adolescents are also frequently viewed as being a difficult group to work with, and practitioners may not want to devote the time needed to establish good rapport with them. These factors are important since the interpersonal relationship between patient and provider is a major factor influencing patients' satisfaction and compliance with health care recommendations.

Adolescents themselves recognize many of these barriers. A needs assessment conducted in California reported that the most common reasons adolescents gave for failing to obtain health care when needed were: cost, parents' belief that health care was not necessary, conflict with school attendance, lack of knowledge about where to obtain care, inconvenience, or unavailability of services [31].

II. CHARACTERISTICS OF SCHOOL-LINKED HEALTH CENTERS

School-linked health centers vary in terms of the specific populations they serve and the services they provide, as well as how they are funded, staffed, and administered. Although the health centers function independently of each other, there are common characteristics that most share:

- They are established to meet the needs of adolescents within a specific community.
- Most are operated by outside agencies rather than the school.
- They are located either on-site or adjacent to the school grounds.
- They require parental consent before serving adolescents.
- All maintain patient confidentiality.
- They employ professionals from multiple disciplines.
- They provide varying degrees of comprehensive health care that usually includes mental health counseling or referral.
- They will refer their clients to other community services when necessary.
- They usually provide reproductive health care services and/or counseling and referral.

Most centers were established to serve high-school students, but there are currently 15 centers that provide health services to students in middle or junior high school. In general, centers in middle schools do not appear to differ from high school-linked centers, although they are less likely

to dispense contraceptives [44]. It has also been reported that the professional affiliation and training of the attending health care professionals is more likely to be in pediatrics rather than obstetrics and gynecology, and involvement of family members in middle-school centers is more likely than in high schools [45].

A. Numbers and Rates of Growth

The first school-linked adolescent health center began operation in 1970. By March 1988, there were 125 active school-linked centers with an additional 100 more in the planning stages. The rapid growth of school-linked centers is also evident among centers serving younger adolescents. In 1988 there were 15 centers serving middle/junior high schools, compared to 10 the previous year.

Although the number of school-linked adolescent health centers is growing rapidly, they are serving a small number of all adolescents. If we estimate the average number of students seen over the course of a year to be 1500 across all centers, 125 health centers are serving no more than 187,500 adolescents. With an adolescent population base of over 35 million adolescents (10 to 19 years), less than 1% are being served by these health centers.

B. Geographical Distribution

In 1987, school-linked health centers were serving adolescents in high schools and middle/junior high schools located in 28 states [46]. Most schools were located in urban

areas where populations were underserved in terms of health care needs. A few have been established in rural areas.

C. Location of Health Centers

Most centers are located on school grounds (85%) or in adjacent buildings (15%). Eighty percent are open during the entire 40-hour school week and almost half maintain summer hours. A small number (18%) of centers have evening, weekend and emergency coverage by staff physicians and an additional 38% have arrangements with community or public hospitals [45].

The issue of whether centers should be located on school grounds or in nearby buildings remains open. Advantages of the on-site center include convenience for students, ease in providing follow-up care, fewer potential problems in linkage with the school system, increased opportunities for center-classroom health education activities, and the potential for increased contact between health center and classroom personnel.

Disadvantages of an on-site location include the fact that services may not be available for youth who are no longer in school. Most school sites close by 6:00 P.M. and on weekends, thus limiting access to services to specific hours of school operation. However, this is also true of many health care systems, not just school-linked ones. Many centers are also closed during the summer months. Furthermore, on-site locations may generate more community controversy than off-site centers.

D. Administrative Sponsorship

Administrative support of school-linked health centers varies. Programs have been administered by hospitals, medical schools, community health centers, local health departments, private not-for-profit organizations, a Planned Parenthood affiliate, and local school districts [47]. Although some of the earlier health centers were started by youth service and other community-based agencies, by 1987, the majority of centers were operated by medical schools or local health departments. This reflects the increasing utilization of state health funds for starting new centers.

It is uncommon for school districts to operate health centers themselves. In Gary, Indiana, the school system created a corporation to operate its program.

While the service provider assumes all of the fiscal responsibility including liability, the school plays a critical role in the organization and functioning of the program. Schools provide space, maintenance, security, and most importantly, access to the students. Schools may also provide health personnel such as school nurses.

E. Funding Sources

School-linked health centers have been funded by a variety of sources representing a mix of public (64%) and private (36%) monies. Public sources of support have included Maternal and Child Health Block Grant (Title V), the Early and Periodic Screening Diagnosis and Treatment Program (EPSDT), Social

Services Block Grant (Title XX), Community Health Centers, Family Planning (Title X), Medicaid (Title XIX), Adolescent Family Life Act, and National Health Services Corps, local city and school district funds, and in-kind contributions [42,45,47]. As of 1986, about half of all funds came from MCH and other state demonstration projects and 14% from EPSDT. In 1987, several states approved funds for school-linked health centers.

Sources of private funding have primarily come from national foundations. The Robert Wood Johnson Foundation is currently funding 20 school-linked clinics in cities with populations of at least 100,000. Each city is receiving up to \$600,000 over a six-year period. Other foundation support has come from the Ford Foundation, Carnegie Corporation of New York, William T. Grant Foundation, Pew Memorial Trust, William and Flora Hewlett Foundation, as well as regional and community foundations. Additional sources of funding have included corporate sponsors. A few clinics charge a small fee for service [48].

Funding limitations present a major problem to programs that must piece together a funding package which has no long-term stability. Program staff must often devote large blocks of time to secure financial support, making fund-raising a costly program activity. Changes in program funding can also cause changes in the services available, which could potentially confuse students about what is available.

F. Characteristics of Adolescents Served

Currently, the largest database from which we can characterize school-linked health centers has been collected by the Support Center for School-Based Clinics, a project of the Center for Population Options (CPO). A CPO survey was conducted in March, 1987, and consisted of 59 centers, which represented 69% of the centers then in operation. The comparability of these 59 centers to the entire population of centers is unknown. All of the centers surveyed by CPO were school-based, meaning they were located on school grounds. The smallest center in the sample served 20 students per month and the largest served over 400 students [46]. Overall, the 59 centers were serving over 70,000 students. Other databases of interest include one from New York City, which includes over 8000 students enrolled in nine high schools [47], one from California representing over 6000 students [31], and a database from Oregon representing over 4,000 students [49].

Most centers will only provide services to enrolled students, although 14% also serve adolescents no longer in school. Approximately 6 programs will see any teenager living in the target area, as well as his/her parents, siblings or children [46].

A high percentage of parents who are offered the program choose to enroll their children, and the reasons for non-enrollment rarely reflect opposition to the clinic itself [45]. The percentage of enrolled students who actually make a clinic

visit varies from approximately 32% to almost 50%. Little information is available on which adolescents are more likely to use clinics and/or patterns of low and high utilization. Without this information it is impossible to determine how well the centers are serving adolescent who need health services, and the impact that the services are having. Some preliminary data suggest that adolescents who use the clinics may be more likely to be attending school (not surprising since this is often a prerequisite for service) and less likely to have medical insurance [31,47].

1. Age

Most centers are located in high schools, although there are 15 in junior high or middle school settings. Thus, the majority of adolescents served are in the 14-18 year-old range. Because centers are often located in schools with high drop-out rates, the age of students served often reflects lower utilization among high school students in the upper grades (i.e., grades 11 and 12).

2. Gender

According to the Center for Population Options [46], an average of 36% of center users are male and 64% are female. Although some sites report no gender differences [31], most do, reflecting the pattern and degree of male underutilization in national data. Centers which offer and promote sports physicals are more successful in attracting male students [31].

3. Racial and Ethnic Background

The racial and ethnic background of students seen in individual centers varies greatly, since they usually reflect the ethnic composition of the school in which a center is located. However, most schools with centers are located in economically disadvantaged areas with high concentrations of minority group students.

4. Socioeconomic Status

There has been an effort to place most school-linked health centers in areas of highest medical need, which includes low income and poverty areas. Patterns of underutilization in less impoverished areas suggests that school-linked health centers could be helpful in these populations as well. A study of middle class adolescents showed that almost half had unmet health needs that school-linked centers could address [25].

G. Services Provided by Centers

The services provided by school-linked health centers vary as a function of their resources (i.e., funding, staffing), the needs of the population they serve, and the level of community acceptance. A critical issue that affects which services will be provided is the conceptualization of the health service model being employed. Specifically, centers must decide whether they will provide crisis care (i.e., acute illness), preventive/educational care, or both. In some cases, health centers begin operation using a prevention model, only to find that most of the care they provide is crisis-oriented [45].

Most centers offer both "drop-in" care as well as scheduled appointments. Most operate during regular school hours (i.e., 8:00 A.M. to 5:00 P.M.), although a few have evening or weekend hours. Many clinics are closed during the summer months. This is a potential problem since the onset of adolescent sexual activity may be most likely to begin during the summer months [50].

More than 95% of clinics provide assessment and referral services to community agencies, diagnosis and treatment of minor injuries, and health education. A large percentage (85%-94%) provide primary health care, laboratory tests, sports/general physical examinations, medications, referral to local physicians, counseling and referral for pregnancy, nutrition counseling and weight control programs, and counseling services in the areas of sexuality and mental health [46].

A smaller but significant percentage (60%-85%) of programs provide gynecological examinations, diagnosis and treatment of sexually transmitted disease, immunizations, EPSDT screening, classroom sex education classes, substance use/abuse programs and parenting education. Dental services are offered by 35% of the health centers sampled.

In terms of reproductive health care, about 21% of the centers distribute contraceptives; 48% will prescribe but do not distribute contraceptives. Among the junior high and middle school health centers, only one will dispense

contraceptives. The remaining health centers refer to collaborating agencies for contraceptives, although many do provide gynecological examinations and screening for sexually transmitted disease. There is evidence that newer health centers being formed are less likely to prescribe contraceptives than centers already in operation [45], as a result of controversy over this service.

Few school-linked health centers appear to be providing services in relation to accident prevention, injury control, control of violent behavior, or physical fitness/exercise. In addition, it is not clear how well adolescents are followed, either when receiving health services from the health center, or when referred to outside practitioners.

H. Staffing Patterns

The 1987 Center for Population Options survey [46] showed that the average program had three paid positions and almost the same number of in-kind, full- or part-time positions. Some programs reported as having as many as 15 full-time, paid positions, while others reported a single position. Center staff usually include a nurse practitioner or physician's assistant, a physician, and a counselor/social worker. Physicians are usually in centers on a part-time basis, either a few hours each day or during specified days of the week. Other specialized personnel used to augment services of core center personnel have included: dental hygienists, nutritionists, dentists, social workers and psychologists. The

Center for Population Options reports that at about 86% of the school-linked health centers there is a school nurse already functioning in the school. Frequently the school nurse works with the staff of the center to deliver primary care, coordinates necessary follow-up activities, and assists in expanding the range of services offered to the students.

Most programs attempt to recruit staff that demonstrate expertise and interest in working with adolescents. In addition, many supporters of adolescent health centers believe it is important that staff be accepted by the community being served. When health center staff are bilingual or bicultural and knowledgeable about the community served by the center, the needs of minority adolescents can be met more effectively. There are, however, serious limitations in the number and availability of minority and culturally sensitive health care professionals and staff currently available to serve minority adolescents.

I. Relationships With School Systems

The school system and its personnel play a crucial role in the acceptance of school-linked centers by students, parents and the community. Health education has traditionally been the responsibility of the schools, which may or may not have the resources to provide well-developed, appropriate curricula in this area. With the presence of school-linked health centers, schools have the potential to strengthen their health education programs both by providing easy access to health care, as well

as through the participation of health center staff in classroom health education activities. This has particular relevance in relation to the provision of AIDS prevention education, which schools are being asked to provide. In addition to contributing space, maintenance and in-kind personnel services, school personnel can facilitate acceptance of the center by virtue of their status in the communities they serve. The school principal can be an especially important spokesperson for the health center. All health centers include school personnel on their advisory boards.

School-linked center staff are integrated into the regular school program in a number of ways. Most (91%) make classroom presentations and many (79%) conduct workshops, seminars and health fairs. Center staff are represented in school committees (44%) attend parent/teacher conferences (47%) and participate in PTA meetings (35%).

One crucial issue is the integration of existing school health staff, such as the school nurse, with the health center. Most (86%) programs are implemented in schools that employ a school nurse. Approximately half of the time, the school nurse is included as part of the health center staff, usually functioning in the role of a coordinator. In the remaining cases, the nurse functions in an interactive, parallel role to the health center staff. Duplication of services rarely emerges as a problem since existing school nurses are often part-time, with large numbers of students to serve. In

addition, many services offered by nurse practitioners are not available from school nurses who may have the RN degree without additional training.

One source of difficulty in the relationship between school personnel and centers is the degree to which school personnel feel threatened by newly established centers. This could potentially occur if school personnel are concerned about school resources being required to supplement center funding. Although this does not appear to be a problem facing most centers, it should be recognized that this could create problems if school-linked centers use funds from the school budget for their work. School personnel could also feel threatened if they feel their roles as guidance counselors and health educators are being usurped. These misconceptions are less likely to emerge if school personnel, especially those related to health, are involved early in the planning stages, and are consulted on matters relating to the provision of health education services. Experience in health centers to date suggests that many school personnel are overwhelmed by the problems facing youth and welcome additional assistance.

J. Linkage of Centers to Community Services

Experience has shown that for school-linked health centers to succeed, the community needs to be closely involved in planning and establishing their operation. Almost all centers have advisory boards including representation from the community, including members from local health departments

(76%), private sector physicians (70%), church organizations (63%), and youth service organizations (60%).

An especially important community linkage is that to other health-providing agencies and individuals. Centers cannot provide all of the health care necessary to serve the adolescent population. They require a functioning network of health care services to which they can refer adolescents. While some health centers report low referral rates (e.g., 4% in one California center [31]), referral rates can run as high as 59% [47]. Problems with long waiting lists at referral agencies can sometimes be overcome when linkages are properly established. Linkages must also be established to assure that patients are followed properly, once services are received. Only one survey to date has reported information on the rate of success in following patients; this survey reported successful follow-up in approximately 60% of their sample [47].

K. Parental Involvement

Almost all (97%) of the programs sampled by the Center for Population Options reported having parents on a community advisory board. However, most programs report difficulties in recruiting parents to take part in planning efforts. There appear to be multiple reasons for this difficulty, including: competing responsibilities for parents living in poverty, distrust of and lack of strong ties with the school, and feelings of powerlessness.

Once centers are instituted, parents are almost always required to give their written approval before the center will provide services to a student. Approximately 11% of centers use a consent form that allows parents to specify which services their child can receive and which are to be withheld. Most parents request the full range of services offered, including family planning services.

III. IMPLEMENTATION ISSUES

Organizing a school-linked health center is complex and may take more than a year from initial planning to actual implementation. There are a number of steps involved in successful implementation of school-linked adolescent health centers. These include the following:

- An assessment to identify unmet health needs among young people in the community
- Mobilization of community support
- Establishment of linkages with health, education, and community resources
- Development of a proposal with the potential to be funded

School-linked health centers are unlikely to be successfully implemented in communities that do not perceive a need for them. The determination of the health needs of adolescents within the community is thus a vital first step. This step is also important since initial needs assessments may be the only data available on adolescents who do not use the

health centers, and can be used later for comparative purposes with clinic users.

Mobilizing broad-based community support for health centers is also crucial. Community groups need to be involved from the initial stages and their concerns addressed. Specific individuals and groups who play a special role in assuring successful implementation include parents, school personnel, school administrators, youth-serving agencies, clergy, the business community and private health care providers. Organizing a community advisory board is a common method of assuring continuing community input and support for the health center. In addition to offering support and guidance and helping to identify funding sources, advisory groups can play an important role in public relations. It is not uncommon for individuals or groups in a community to object to school-linked health services for ethical, religious or personal reasons. The objections of a few people can obstruct implementation in the absence of strong community support.

Strong linkages with a variety of institutions also need to be in place. School-linked health centers require that health care providers be secured, that school systems be prepared to deal with their operation, and that external health systems be prepared to work with the school center. These centers cannot survive as isolated health care facilities, but must be integrated with other community resources to provide adolescents with comprehensive health care. Linkages also need

to exist between the centers and the legal system and youth advocacy organizations, for dealing with issues of continuing support and confidentiality of services.

It would be useful to study the successful implementation of centers in certain communities. What factors determine the balance of supporters and opponents in a community? How have successful endeavors overcome community opposition? To what degree are individual leaders responsible for the success or failure of these efforts? Well-documented case studies would be useful in understanding these questions, and in assisting communities as they consider ways to serve adolescents in their localities.

IV. ISSUES IN THE EVALUATION OF SCHOOL-LINKED HEALTH CENTERS

The evaluation of school-linked adolescent health centers has, and will continue to be a challenge. Many of the issues in the evaluation of school-linked adolescent health centers are not unique to this form of health care delivery. They are generic issues which confront any evaluator wishing to demonstrate program effectiveness. There are, however, a few aspects of the school-linked centers that are unique. Both types of issues are discussed in the following sections.

A. Conceptual Issues

The important goals and controversial nature of school-linked health centers require that they be evaluated carefully. Yet, advocates of school-linked health centers suggest that the

centers are being subjected to far more demanding demonstrations of effectiveness than has been the case with other health care delivery systems. This is true, but only in part. Evaluations of health care delivery systems often consist of demonstrating cost-effectiveness or increases in utilization for underserved segments of the population, rather than their effects on health per se. If one chooses to view school-linked health centers mainly in terms of its service delivery component, it may be reasonable to consider outcomes such as utilization and cost as sufficient for demonstrating program success. Evaluations of the diagnostic and treatment components of health care are more likely to assess treatment effects on health outcomes. To the degree that we view school-linked adolescent health centers as a "treatment" designed to affect a variety of complex behaviors, we should expect sound evaluations in these domains as well.

Both supporters and critics of the approach have expected school-linked adolescent health centers to influence a broad range of behavioral outcomes such as sexual activity, contraceptive use, pregnancy rates, substance use, depression, school attendance and other problem behaviors, as well as general health status. The question has been raised as to whether it is realistic to expect school-linked health centers to affect such complex behaviors, when other intervention programs, comprehensive or otherwise, have had limited success in doing so. This is a crucial point that has significant

implications for demonstrating program effectiveness and for the acceptance of these health centers. A failure to achieve these ambitious goals may overshadow some of the real benefits that the health centers can offer, such as improving adolescents' access to health care. In the absence of clearly defined and attainable goals, it will be difficult to demonstrate program effectiveness.

B. Practical Issues

Practical aspects of conducting evaluations of school-linked health centers present major difficulties. Evaluations require resources for their planning as well as their implementation. They can be expensive; many programs have the resources to operate, but not to conduct a systematic evaluation of their effectiveness. Program staff in health services are usually service providers with no training in evaluation methodology. They may be uncertain about the importance of evaluation for future funding, viewing it as a drain on limited resources for services.

The issue of who should conduct program evaluations is also important. External evaluators may have the methodological expertise to conduct evaluations but little knowledge of the specific program they are evaluating. This can generate apathy or non-cooperation on the part of program staff, who may feel pessimistic about the ability of outsiders to understand the program and to recognize its successes. On the other hand, evaluations that are conducted by programs

themselves are subject to significant bias, and may not provide replicable results. It is thus highly desirable that evaluations be conducted by outside evaluators who work with program implementors, and that such evaluation be required by funders.

In contrast to the health sector, schools have an ambiguous relationship to research, particularly educational research. Schools are legally bound to protect students in their charge. School policies regarding permission to conduct research and for the protection of human participants in research, particularly in large urban areas, can be significant barriers to the kinds of studies that can be conducted [31].

C. Methodological Issues

Four critical problems exist in relation to the design of evaluations of school-linked adolescent health centers: (1) The identification and recruitment of appropriate samples to serve as comparison groups; (2) The detection of effectiveness given sample sizes, the use of school-wide statistics, and patterns of utilization by adolescents; (3) Wide variability among programs in their actual operations; and (4) A lack of clarity in the conceptualization of successful outcomes, and their measurement.

1. Comparison Groups

The lack of appropriate comparison groups in evaluations of school-linked health centers is a major factor limiting current knowledge of their effectiveness. The determination of

what constitutes an appropriate comparison group, and accessibility to those groups present significant barriers to evaluators. As a result, some evaluations use no comparison group at all, reporting on changes over time, such as pregnancy rates. The primary problem with this approach is that change attributed to the health center may actually be due to other factors such as external events (e.g., media campaigns, legislation).

The comparison of population rates over different time periods is also subject to distortion because the individuals studied at the first time period may differ in important ways from those studied at the second time period. Thus, for example, students who drop out of school between data collection periods would be represented in initial rates, but not in later rates. This is especially problematic since the very factors associated with school dropout, such as substance use or school failure, are also the outcomes that the school-linked health center is attempting to influence.

An alternative sampling method that bypasses this problem is to examine school-wide rates for a specific grade range at multiple time points (e.g., comparison of 9th graders in 1985 and 9th graders in 1986). This kind of cohort analysis is still subject to bias if the school population changes in any significant way (e.g., alteration of consent requirements for school center treatment) or if more general population changes take place (e.g., statewide increases in adolescent pregnancy

rates).

A number of evaluation studies have compared outcomes of interest in students who use the health centers to those who do not. In these studies, self-selection factors associated with center use may confound results. Adolescents who use the health centers may differ from those who do not in ways that could affect outcomes. For example, if sexually active adolescents who use school health centers are more likely to use contraception than those who do not, comparing pregnancy rates in the two groups would be biased by these differences. The impact of this self-selection factor is likely to be underestimated in the absence of data that describe differences between center users and those who do not use the centers.

Comparing rates in center users to national data is subject to the same self-selection biases, and also has the potential of making health center outcomes look less successful than they might actually be. Using pregnancy rates as an example, centers are usually located in communities with higher than average pregnancy rates among adolescents. Comparing pregnancy rates in these communities to national data after a school-linked center is instituted would be quite misleading.

One approach that would be reasonable to utilize in evaluation efforts would be to compare adolescents in schools with health centers to those in similar schools that do not have a health center. By comparing center users to similar students who are not offered the program, self-selection

factors no longer apply.

2. Sample Sizes and The Use of School-Wide Statistics

The samples that are used in evaluations are typically small, making statistical comparisons difficult. This is especially problematic when the effects of the health program are subtle, relatively small, and difficult to measure. The smaller the number of adolescents served by the health center, the more difficult it is, statistically, to demonstrate that change has occurred. Analyses within population subgroups are virtually impossible.

Evaluations that use school-wide statistics to demonstrate change (or for use as comparison data) also have a difficult time demonstrating positive effects. A description of center utilization patterns illustrates this point. A typical health center may serve a high school of 1000 students. Eight hundred students may enroll in the program, and 400 may actually use the center. Of the 400, there may be 50 who become regular users of the center's services with the remaining 350 coming into the clinic 1-3 times in a school year. In this hypothetical case, presented by the Director of the Support Center for School-Based Centers [45], the conceptualization and measurement of the effects of the center will vary depending on an adolescent's use of its services. To complicate matters even further, the high utilizers may avail themselves of different services within the array provided. Results based on

the entire student body are likely to dilute any measured successes of the centers. This description serves as a sobering illustration of the problems facing evaluators.

3. Variations Among Centers

In assessing existing evaluations of school-linked health centers, it is important to look beyond studies of individual health centers, and to derive a sense, overall, of how effective these programs are, which program elements are associated with specific outcomes, and for which adolescents. Variations among programs, however, can limit our ability to reach general conclusions. Although most school-linked centers share similar philosophies, their operations are quite different. Centers differ in terms of the type of staff they employ, the services they offer, and their physical location. Perhaps even more significantly, they may vary in the quality of care they deliver, the competence of their staff, and the health education programs they sponsor. To the degree that these program variations affect outcomes, it will be difficult to arrive at a broader sense of how well centers work.

4. Conceptualizing and Measuring Outcomes

Conceptually, what constitutes a successful outcome must be addressed and defined. What would be considered a reasonable short-term outcome? Are our expectations for long-term outcomes different? If an adolescent stops using drugs during school, and limits drug use to after school, is that a success? If a student signs a contract promising not to attempt suicide

during the next six months and doesn't, is that a success? These outcomes signify some kind of success, but they are not clearly defined nor are they easy to measure [51].

Furthermore, some of the critical outcomes may not be detected in the short-term. It is reasonable to ask whether long term outcomes on adult health status and mental health are more important outcomes to assess than short-term ones. The relative newness of school-linked health centers has precluded such evaluation to date. However, attention to the prospect of longitudinal investigations is warranted.

Once some of the conceptual issues are addressed, the issue of how to measure outcomes becomes important. Most evaluations rely on adolescents' self-reports of their behavior to demonstrate change. These self-reports are subject to bias, especially when the adolescents feel that they are expected to respond in a certain way [52]. Adolescents who receive health education messages via the centers may be even more likely to respond in the desirable direction, irrespective of their actual behavior. Some evaluations recognize this problem, and attempt to increase the validity of the adolescents' reports by a variety of means. The issue of self-report will, however, always be a problem, particularly when comparison groups are not involved. Some behaviors, such as sexual activity, are not amenable to external validation. Others such as substance use can be validated, but generate ethical questions about their use, particularly in school settings. Despite the lack of

perfect measures, awareness of response bias and knowledge of current research on minimizing its effects can help evaluators design and administer better measures.

V. FINDINGS FROM EVALUATIONS OF SCHOOL-LINKED HEALTH CENTERS

Despite the significant conceptual, practical and methodological problems associated with evaluating school-linked health centers, some evaluation data have been reported. These evaluations have examined program effectiveness in a number of ways: utilization of services; cost-effectiveness; impact on health status, problem behaviors, and school attendance; and parental and student attitudes. While these evaluations often suffer from the limitations discussed earlier, they do provide important early information that can be used in program development and in furthering our understanding of how we should be evaluating health centers in the future.

A. Utilization Patterns

Utilization data are an important source for assessing the effectiveness of health care systems. Utilization can be thought of as a "necessary but not sufficient" measure of effectiveness (since an unused service cannot be an effective one). Using this criterion, school-linked health centers appear to be quite successful.

In schools where they are offered, a high percentage of students enroll in the health centers. The average enrollment

rate is 71% [46]. A smaller number of enrolled students actually use the centers, ranging from 32% to almost 50%. These seem to be relatively high usage rates when one considers the fact that not all students, enrolled or not, would be expected to require health care at any one time.

Many adolescents who are seen in the health centers are self-referred [31], and would not receive health care if the center did not exist. In one health center, 38% of the center users reported that they would not have sought alternative care if the center were not there; an additional 9% said they did not know where they would go [47]. Twenty-six percent of clinic users said that they had no previous source of medical care other than the emergency room prior to the opening of the school center.

Although some adolescents visit the centers only once, regular utilization patterns emerge in perhaps 30% of enrollees [53]. Students often "drop-in" for appointments, although many do make appointments. A small portion of students become chronic center users. A very small number of extreme problem cases which require immediate crisis management are referred to centers when school personnel have exhausted other means of dealing with the problem.

Almost nothing is known about how adolescents who use school-linked centers differ from those who do not. The limited information we have suggests that these adolescents may be less likely to have medical insurance than students in

general [31]. It has been difficult for evaluators to collect information on students who do not use the health centers, with the exception of needs assessment data on school populations. It is critical to develop means for evaluators to collect data on students who do not use the centers as well as those who do, for two reasons. The first reason, which was discussed earlier, is that our interpretation of program outcomes can be affected. Secondly, it is impossible to determine how well the centers are serving adolescents in need of services unless information is available on non-users. If students in great need are not using the centers, we need to know why. A related issue concerns adolescents who are no longer in school. Most school-linked health centers do not serve this high risk group. To the extent that utilization is a critical outcome, meeting the health care needs of this group also becomes important.

Most visits to school-linked centers are for physical examinations, acute illnesses and minor emergencies [31,47,54]. Mental health problems are discovered in many visits although they may not be the presenting complaint. In four San Francisco area centers, between 15% and 36% of visits resulted in primary mental health diagnoses. In one midwestern center serving middle school students, over 25% of the clinic users reported psychological symptomatology [55]. Anecdotal reports from staff in a variety of health centers have also disclosed a high prevalence of sexual abuse and parental drug use.

Reproductive health care accounts for under 25% of the services provided [46]. This is a relatively low proportion given the populations being served. For example, in the San Francisco area, around 35-60% of the females seen in the centers were sexually active. Half of these girls never used any method of contraception. Yet utilization rates for contraceptive care were low in these centers. The reasons for these, and other low rates, vary. For some centers, low utilization for reproductive care is due to the limited nature of services offered. Centers that do not provide family planning, for example, attract fewer students with reproductive health complaints [56]. Some centers offer reproductive health services, but are not aggressive in informing students that such services exist. In some communities, alternative means of obtaining contraceptives exist.

B. Costs of School-Linked Health Services

In an era of diminishing resources for many health and human services, the question of the cost of school-linked health centers becomes an important issue. The broader question, of course, is whether this approach to delivering health services is cost-effective. Unfortunately, the "effectiveness" part of the picture is usually more difficult to ascertain.

In terms of cost itself, it has been estimated that school-linked health centers cost between \$50 and \$150 per student per year. Only one study has done a direct cost

comparison of these centers [57] although there is at least one evaluation effort currently collecting information in this area [31].

The results of the single published study [57] showed that the average cost of a routine physical examination at the school-linked center was \$11.25, compared to a cost of \$45.00 at a private physician's office in the same community. If one also considered the lost wages of parents who accompanied the adolescent, the cost of a visit to a private practitioner rose to \$59.30. Some critics may argue that the comparison is not relevant, since many of these young people would not have received care without the school center. If this is indeed the case, then it would appear that school-linked centers are doing a good job in their goal of providing health care to adolescents.

C. Health Status and Detection of Health Problems

Few evaluation efforts have collected specific information on indicators of health status. More often, centers will report on the number of undetected conditions that they detect as a result of center visits. Health centers report serious conditions in as many as 25% of the adolescents they see, including diabetes, heart disease, anemia, parasites, seizure disorders and ulcers. High rates of depression are reported by many centers. Almost every site reports a high incidence of sexual abuse [58].

D. School Attendance and Retention

The effects of school-linked centers on absenteeism and dropout remains to be determined. In nine New York centers, students who used the centers were less likely to miss school than students who did not use center services. It is not clear whether the differences represent pre-existing differences and a self-selection phenomena, or whether attendance was influenced by the health center. Other centers have reported no differences in absenteeism. Some centers have reported higher school continuation rates among pregnant adolescents [4]. Centers that provide well-baby services and childcare may have a greater effect on school continuation among adolescent parents than those centers which do not provide these services.

E. Impact on Problem Behaviors

The Kansas City centers have reported significant decreases in the number of adolescents involved in substance use during the two year period (1983-1985) following the opening of the center. The percentage of center patients who reported ever using cigarettes decreased from 13% to 5%; the percent who had tried alcohol decreased from 41% to 36%. The percentage of patients who had tried marijuana decreased from 31% to 21%. Although decreases were attributed to the presence of the school health center, no comparison data on substance use are available for similar schools without school-linked health centers. The reported decreases do appear to be greater than those reported for national samples over the same time

period. However, these data must be carefully interpreted in the absence of control groups and apparent changes in the community during the study period.

Although opponents of school-linked centers have argued otherwise, sexual activity among students has not been shown to increase when school-linked centers are offered [54]. In fact, while programs generally show no changes in the rates of sexual activity among students [52,59], at least one study has reported a lower age of onset of first intercourse among program participants [60].

Two programs have shown changes in overall pregnancy and birth rates associated with school-linked centers. The St. Paul program reported a decrease in the birth rate from 79 births per 1000 adolescents in 1973 to 35 births per 1000 in 1985-86. These data do not control for abortion rates. In addition, the comparison between the 1973 and 1985 data may be unjustified, given other differences in the nature of the two samples. The second evaluation reporting changes was conducted by Johns Hopkins University in 1986 on an off-site, school-linked center providing reproductive health services to inner-city adolescents in Baltimore. Education and counseling were available on the school site, and services were provided at a nearby center, by the same staff. After three years, the pregnancy rate among sexually active students in schools that instituted the program declined by 30% (approximately 21% became pregnant over the three year period), compared to a 58%

increase in the pregnancy rate among students in control schools (approximately 50% became pregnant) [60]. Conclusions are limited by significant attrition in the experimental schools, and a lack of demographic data on which to compare experimental and control schools.

Although some programs report higher contraceptive use in program participants, others fail to show changes in contraceptive behavior. Those that do report changes report higher rates of contraceptive use after center visits [47], higher continuation rates for participating students [4], increased use of condoms in males, or more frequent contraceptive use [4,60].

Caution must be exercised in interpreting these data. A major problem plaguing most of the reports on contraceptive use, sexual activity, and substance use is the fact that the behaviors are self-reported, with little ability to verify their accuracy. This is especially salient within the context of the school-linked center, where there may be a strong social norm operating in the direction of reporting health-promoting behaviors.

Mental health outcomes such as anxiety, depression, loneliness and decline in sexual abuse are particularly difficult to measure. Outcomes such as suicide occur with a low enough frequency to make impact of prevention programs almost impossible to measure. Reports from at least one center show that one student comes in each week saying that he/she is

either contemplating suicide or has made an actual attempt. Clearly, these are crucial encounters given our understanding of suicidal behavior and the importance of responding to adolescents' cries for help. Other centers have reported reductions in students' feelings of hopelessness and suicidal ideation.

F. Adolescent Attitudes and Responses

A number of studies have reported that students like the school-linked health centers, feel that the centers have a positive impact on their health, and a positive impact on their health behaviors. Aspects of school-linked centers that adolescents seem to like include the staff attitudes, helpfulness and communication abilities; the services offered; convenience, and confidentiality. Patient satisfaction data such as these are often not terribly useful in judging program effectiveness, since most people tend to report that "things are fine" when asked questions in a very general way. More convincing evidence of adolescents' attitudes towards school-linked centers was reported by Siegel and Kriebel [35], who showed a rate of failed return appointment to be only 5.6%. This is quite remarkable considering the almost 50% failure rate for follow-up appointments among adolescents being treated in more traditional health settings [61].

G. Parental Attitudes and Responses

One measure of how parents view the school-linked adolescent health center is the percentage who choose to enroll

their children in these programs when they are offered. The Center for Population Options reports that on average, 71% of parents who are offered a program choose to enroll their children [46]. Enrollment rates as high as 98% and as low as 41% [47] have been reported. Most of the parents who did not enroll their children in New York City said that they never received an enrollment form. Among parents who have children enrolled in a school-linked health center, attitudes also seem positive. In a telephone survey of 99 adults (primarily mothers) whose children were enrolled in a school center, 98% reported wanting the center in their child's school [47]. Among those who had an opinion (65%), 94% felt the center was doing a satisfactory job or better. More than 90% of the parents felt that the health center should provide services such as first aid, physical examinations, immunizations, and counseling about drugs and alcohol. A large majority (between 80% and 90%) felt that the health centers should administer treatment of health problems and provide family planning, abstinence counseling and laboratory tests.

In terms of parental feelings regarding reproductive health care, 55% of the parents felt that sexually active students should be provided with birth control supplies or prescriptions. However, 61% of these parents also felt that parental permission should be required before giving the student a prescription for birth control. Fifty-nine percent felt that parental permission should be required for the

dispensation of birth control at the health center site. It should be noted that the number of parents who felt their child was or was not sexually active was not assessed.

H. Community Attitudes

In a recent survey of almost 1000 adults residing in North and South Carolina, almost 80% favored the establishment of health centers in public schools [62]. A recent Harris Poll indicated that 69% of parents favor requiring public schools to establish links with family planning centers.

In a survey conducted by the American Medical Association of 2750 physicians, a large majority (87%) reported that they would refer their adolescent patients to specialty services, if available, for problems relating to reproductive health, substance use and mental health [63]. However, some physicians in the private health care sector may view school-linked health centers as potential threats to their economic viability. Providing these practitioners with information about referral rates from established school centers may alleviate some of these concerns.

I. Reports of Ongoing Efforts

There are several data collection efforts that are underway. The degree to which these evaluations will correct prior deficiencies is yet to be determined. Among these efforts are the following:

- Robert Wood Johnson Foundation Evaluation Studies:
Grant to evaluate school-linked health centers.

- Center for Population Options Evaluation Report: An in-depth study of six school-linked centers to be released in the Summer of 1988.
- University of California-San Francisco Evaluation Studies: Conducting evaluations of 8 centers in both Northern and Southern California.
- Individual School-Linked Health Centers: Many individual centers are conducting their own evaluations.

J. Summary of Needed Research and Evaluation Efforts

The attention being placed upon school-linked adolescent health centers and demands for demonstrations of effectiveness requires that they be evaluated carefully. It will, however, be difficult to demonstrate program effectiveness in the absence of clear and attainable goals and objectives, and as a function of practical and methodological issues. Practical issues include programs' limitations of resources and expertise to conduct evaluations. Methodological limitations have included difficulties in identifying and obtaining appropriate samples to serve as comparison groups; difficulty in detecting successful outcomes within large school populations; and considerable variability among centers in how they actually operate. A major evaluation study, including comparison schools and matched subjects, would do more to further our understanding of school-linked centers than a score of reports on single centers. It is highly desirable that such an evaluation effort be conducted by an independent group.

A fundamental issue in the evaluation of these health centers concerns the specification of outcomes that can serve

as indicators of effectiveness. Utilization data are important since an unused service cannot be an effective one. However, far more information is needed on patterns of utilization among adolescents who use the centers, as well as information on the types of adolescents who are not using the services. This kind of understanding has significant implications for evaluations of the effectiveness of the centers. In addition, it will be impossible to determine how well the centers are serving youth in the absence of this information.

Future evaluation efforts should also examine a number of areas that have received insufficient attention to date. One neglected area concerns the quality of the health care services that are provided in school-linked adolescent health centers. How well are the centers linked to outside support services? How well are patients followed? Evaluation of this component of the school-linked centers is clearly important if centers are to be assured that adolescents are receiving appropriate care. It is also important that poor care be ruled out as a potential reason for lack of success in centers. Mechanisms need to be put in place that will allow centers to determine that quality care is being provided, and that adequate follow-up of referrals takes place.

The cost-effectiveness of school-linked health centers has also not been adequately investigated. A study comparing the cost of various types of health service delivery is being conducted but does not include school-linked adolescent health

centers. This information is particularly important to policy makers, and could thus have a major impact on funding priorities which have hampered so many centers. Also related to cost issues is the question of how health services for adolescents are currently financed, and the impact of the changing demographic profile of the adolescent population on future financing issues.

Examination of alternatives to school-linked health centers are also important to examine. Criteria that are considered important in the provision of adolescent health care such as accessibility, lack of financial barriers, assurances of confidentiality and caring staff describe school-linked adolescent health centers, but also characterize other approaches to health care delivery such as adolescent clinics in hospital-based settings, community-based services, and some health maintenance organizations (HMO's). Since no comparative studies have been conducted under different conditions and for different subsets of the adolescent population, the question can not yet be answered as to which of the existing approaches - or others yet to be developed - provides the most effective delivery of health care to adolescents.

VI. THE POTENTIAL EXPANSION OF SCHOOL-LINKED HEALTH CENTERS

A. Support for Specialized Adolescent Health Centers

Currently, the major source of support for initiating school-linked health centers for adolescents comes from the local community. Many national organizations also view the school-linked centers as promising because of their concerns about the unmet needs of the adolescent age group. Some of these organizations include: the American Academy of Pediatrics, Society for Adolescent Medicine, National Education Association, Association of School Nurses, the American College of Obstetrics and Gynecology, and the American Public Health Association.

B. Barriers to Expansion of School-Linked Health Centers

There are three major barriers to the further expansion of school-linked health centers. The lack of long-term funding for the centers is among the most serious barriers to their further development. The paucity of research and evaluation studies supporting the effectiveness of the centers constitutes a second barrier, and one that may have implications for funding as well.

The third major barrier is the provision of family planning services in school-linked health centers. The National Conference of Catholic Bishops has issued a statement opposing the provision of contraceptive services through

school-linked centers on both moral and practical grounds [64]. Religious fundamentalists and anti-abortion groups have also mounted energetic campaigns to oppose school-linked centers. Nevertheless, it appears that in places where a broad coalition of community leaders has supported the establishment of a school-linked health center, the net effect of these opposition efforts has been small.

C. Legislative Initiatives

As the school-linked health care movement has grown, public policymakers have become aware of the potential of this approach to adolescent health care. Prior to 1985, no state legislature was involved in supporting school-linked health care. By 1987, 24 of the 33 states that had school-linked centers introduced legislation or created task forces to support the continued growth of these centers. Many of the bills introduced failed to survive due to lack of support or a Governor's veto. There have, however, been a number of states, such as Michigan, in which health centers have been supported. In Michigan, a new adolescent health initiative received \$1.2 million to fund six existing centers and to create 6-10 additional centers. Long-range plans in Michigan call for 100 centers to be located throughout the state. Currently, seven states directly fund school-linked health centers, including Connecticut, Illinois, Michigan, New Jersey, New York, Oregon and Wisconsin. Nationally, bills have been introduced in 1986 and 1987 calling for \$50 million in "school-based adolescent

health service demonstration projects" [65]. Hearings have been held, but the bills have not moved beyond the committee stage.

VII. POLICY CONSIDERATIONS

A. Program Development

There remain many unanswered questions regarding appropriate approaches to serve adolescents. A careful assessment of what we currently know about effective and promising approaches to providing health care services to adolescents would be a useful early step. Based on this assessment, innovative approaches and models could be developed to better serve youth.

Modifications that enhance current approaches in terms of accessibility and effectiveness could also be addressed. For example, the extension of school-linked centers to serve adolescents who have dropped out of school would offer the potential of reaching a group of very high risk youth. Adolescents in suburban and rural environments, across a range of socioeconomic strata, also appear to have difficulty in obtaining needed services, and could benefit from school-linked health services.

B. Education of Adolescent Health Professionals

An essential component in the delivery of health care to adolescents is competent health professionals who are sensitive to and care about them. There is a critical shortage of

appropriately prepared professionals to deliver health care to adolescents. Programs such as post graduate fellowships that educate health professionals to serve the adolescent population exist, but they do not appear to be adequate to serve the size of the population in need of services, and the nature of those populations. As a foundation for educating health care providers about adolescents, information about how different professional disciplines prepare providers for working with adolescents is needed. An effort should be made to support the dissemination and adoption of exemplary educational programs that currently produce health professionals to serve the adolescent population, such as the interdisciplinary adolescent health training programs supported by the Division of Maternal and Child Health within the United States Public Health Service.

Shortages of health professionals from ethnic and racial minority backgrounds are especially evident and will become more serious as the proportion of minorities in the adolescent population increases over the next decade. Successfully anticipating future needs for human resources in adolescent health care will have a major impact on the quality of health care for adolescents in the future.

C. Public Education

Although there is growing awareness of the need to attend to the health care needs of adolescents [43], the level of public information remains less than optimal. Since public

interest and support are essential for the creation of new initiatives that will increase health services for adolescents, more attention should be focused on efforts to inform parents, the American public, and key policy makers about the nature of adolescent development, particularly in relation to their health status and needs for appropriate services. The news and entertainment media could play an important part in providing this education. Information should be sought on how knowledge about the health status of adolescents could be better communicated through the use of these media.

It would also be useful to have a critical examination of current health education in the schools and other youth settings, and what changes are needed to contribute to better understanding among adolescents about their health needs and ways to obtain needed services and the promotion of better health habits and lifestyles.

D. Evaluation of Adolescent Health Care Models

As this report has indicated, only preliminary data are available about the impact of school-linked health centers on adolescents. There remains an urgent need for careful evaluation of the effectiveness, quality of services, and cost of school-linked adolescent health centers. It is not clear what aspects of the center approach are important. Is it the comprehensive care component, the accessibility of the centers, the nature of the staff, or some other aspect? Such studies should attend to patterns of utilization, organization of

services, financing, and quality of care issues, as well as adolescent health status and outcomes. To the extent that longer term outcomes are important, the prospect of future longitudinal investigations should be considered. Careful evaluation is desirable before the school-linked approach becomes firmly established in the health care system. Practical problems in conducting such evaluations will require creative solutions.

Evaluation efforts should not be limited to school-linked health centers. Attributes of health care models that have been considered to be important for adolescent health are characteristic not only of the school-linked center but other models as well, such as hospital-based adolescent clinics, HMO's, and community-based models. Comparative studies that include other methods of delivering health care to adolescents are urgently needed.

VIII. CONCLUSION: THE FUTURE OF SCHOOL-LINKED ADOLESCENT HEALTH CENTERS

The question of whether school-linked adolescent health centers will be an important component of the health care delivery system for adolescents cannot yet be answered. Although there is much to be learned about the effectiveness of school-linked adolescent health centers, they clearly are meeting some of the health care needs of adolescents at a relatively low cost. It may be unreasonable, in view of the

information currently available, to wait for more definitive reports on the effectiveness of the centers. The extent of adolescents' unmet health needs suggest that school-linked health centers will continue to expand into communities that recognize their promise. Adolescents across a range of socioeconomic strata appear to have difficulty in obtaining needed services, and school-linked centers offer a promising alternative to problems of accessibility.

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